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TITLE: YAG LASER BEAM HANDY TORCH

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ABSTRACT:

PROBLEM TO BE SOLVED: To widen the machining range of a work without damaging the original simplicity of a handy torch by integrally attaching a small size filler supplying device on the YAG laser beam handy torch.

SOLUTION: An operator grasps a holding handle 13 to hold the handy torch 1 and a prescribed machining to a work is performed by irradiation of the YAG laser beam L from a nozzle 6. At this time, in the case a gap exists between the works as base stocks to be welded, the necessary filler wire can easily be supplied from a filler nozzle arranged near the machining nozzle 6 through a filler supplying device 10 fixed to the handy torch 1 body in the condition of holding the handy torch 1 body. Therefore, the operation can be performed without damaging the original simplicity of the handy torch 1.

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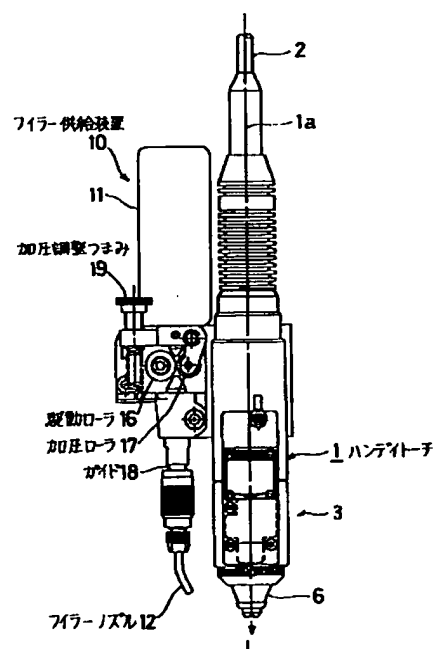
(54) 【発明の名称】 YAGレーザハンディートーチ

(57) 【要約】

【課題】 YAGレーザハンディートーチに、その手軽さを損うことなしに、例えば隙間を有する両素材の密封溶接加工等にも使用し得る手段を提供する。

【解決手段】 このため、従来様式のYAGレーザハンディートーチ1の本体に、ファイラーワイヤ供給駆動用モータ14を内蔵する取手13と、ファイラーワイヤリール11と、駆動機構16、17、18及びトーチヘッド3の加工ノズル6に近接配置したファイラーノズル12とより成る小形のファイラー供給装置10を一体的に付設搭載した。

図1の正面図



【特許請求の範囲】

【請求項1】 YAGレーザトーチ本体に、ファイラワイヤー送給駆動モータを内蔵した取手ハンドルと、ファイラワイヤーリールと、ファイラワイヤ駆動機構と、前記トーチ本体の加工ノズルに近接配置したファイラノズルとより成るファイラ供給装置を一体的に固設したことを特徴とするYAGレーザハンディトーチ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、手持ち式のYAGレーザ加工装置としてのハンディトーチに関するものである。

【0002】

【従来の技術】例えば、板材ワークの溶接または切断等に使用されるこの種の従来の手持ち式YAGレーザハンディトーチは、その一例の外観図を図4に示すような一般的な形状を有していた。

【0003】21は、レーザ加工用トーチ本体部で、手持ちハンドル部となる。22は、レーザビームLを放射するワーク加工用ノズル部23を有するトーチヘッド部、24は、不図示のレーザ光源より内部の光ファイバによりレーザビームをトーチ本体部21に導くためのトーチリードを示し、前記光ファイバからのレーザビームを不図示の後述するコリメータレンズにより平行光線に拡散し、再び集光レンズで集光して、ノズル部23よりレーザビームLを放射させて加工を行うための光学系を有している。

【0004】

【発明が解決しようとする課題】しかしながら、この種のYAGレーザハンディトーチは、従来、主として板材ワークの仮付け、もしくは板材ワーク母材同士の溶接等に用いられ、例えば母材間に連続的な隙間を有する継手形状には対応不可能であった。

【0005】すなわち、製品としての気密性を要求されるものに対しては信頼性が低く、この種の用途には使用できなかった。

【0006】以上のような母材同士の隙間充填溶接用には、例えば適当な金属材料ワイヤ等のファイラが用いられるが、この種のハンディトーチにあっては、手持ち形式の操作上、同一作業による別個のファイラワイヤの同時供給の精密操作は事実上不可能であるため、この種の用途には使用できなかったため、用途が限定されていた。

【0007】本発明は、以上のような局面にかんがみてなされたもので、ハンディトーチに、小形のファイラ供給装置を一体的に搭載することにより前記加工用途の幅を拡げることを目的とする。

【0008】

【課題を解決するための手段】このため、本発明においては、YAGレーザトーチ本体に、ファイラワイヤー送

給駆動モータを内蔵した取手ハンドルと、ファイラワイヤーリールと、ファイラワイヤ駆動機構と、前記トーチ本体の加工ノズルに近接配置したファイラノズルとより成るファイラ供給装置を一体的に固設したことを特徴とするYAGレーザハンディトーチを提供することにより、前記目的を達成しようとするものである。

【0009】

【作用】以上のような本発明構成により、YAGレーザハンディトーチ本体に、小形のファイラ供給装置を搭載したため、同一作業者が、その手軽さを損うことなく、互いに隙間を有するワーク素材の気密溶接加工等を行うことができ、その加工用途を広げることができる。

【0010】

【発明の実施の形態】以下に、本発明の実施の形態を、一実施例に基づいて詳細に説明する。

【0011】

【実施例】図1に、本発明に係るYAGレーザハンディトーチの一実施例の側面図、図2、3に、それぞれ図1の正面図及び上面図を示す。

【0012】(構成)1は、このハンディトーチ本体で、軸中心線1aを有する。2は、トーチリードで内部に光ケーブルを有し、不図示のYAGレーザ光源装置からレーザビームLを、トーチヘッド3内部のコリメータレンズ4に導き、平行光線に拡散されて集光レンズ5に到り、再び集束されて加工用レーザビームLとして加工ノズル部6から放射され、加工に使用される。なお7は保護ガラス、8は加工部表示用CCDカメラ、9はアシストガス継手を示す。

【0013】本実施例の特徴は、本発明に係る補助充填材料(ファイラ)の供給装置10を、ハンディトーチ本体1に一体的に付設搭載したことにある。装置10は、ファイラとしての例えばアルミニウムまたはステンレス鋼等のワイヤーリール11を有し、このファイラワイヤを、トーチの加工ノズル6に近接配置したファイラノズル12から供給するための駆動装置を備えている。13はトーチ本体1の取手ハンドルで、その内部にファイラワイヤ送給駆動用モータ14を内蔵し、取手ハンドル13の根本部に出射用ボタンスイッチ15を備えている。さらに、駆動機構として駆動ローラ16、加圧ローラ17、ガイド18等を含み、加圧調整つまみ19を備えている。

【0014】(動作)以上のような構成において、作業者は、取手ハンドル13を握ってトーチ1を保持し、ノズル6から放射されるYAGレーザビームLにより所定のワーク加工を行うが、既述のように各素材ワーク間に隙間を有する場合、本発明構成によれば、トーチ本体1を保持したまま、本体1に固設されたファイラ供給装置10により、必要なファイラワイヤを、加工ノズル6に近接配置されたファイラノズル12より容易に供給することができるため、ハンディトーチ1本体の手軽さを損

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うことなしにこの種の作業を行うことができる。

【0015】

【発明の効果】以上、説明したように、本発明によれば、YAGレーザーハンドイトーチ本体に、小形のファイラー供給装置を一体的に付設搭載したため、ハンドイトーチ本来の手軽さを犠牲にすることなく、素材ワーク加工用の幅を広げることができる。

【図面の簡単な説明】

【図1】 一実施例の側面図

【図2】 図1の正面図

【図3】 図1の上面図

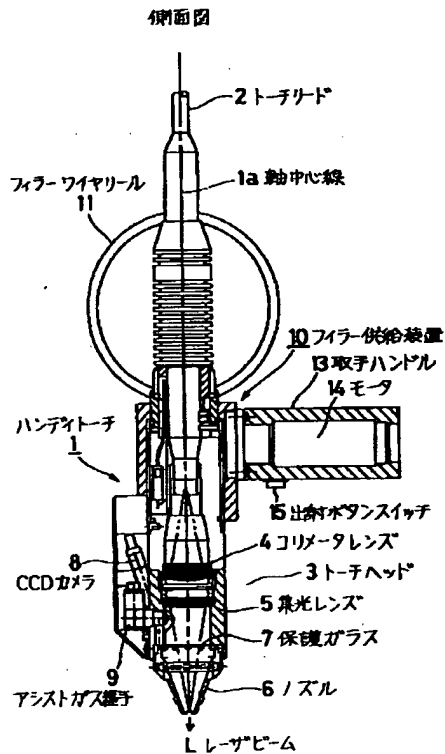
【図4】 従来のハンドイトーチの一例の外観図

【符号の説明】

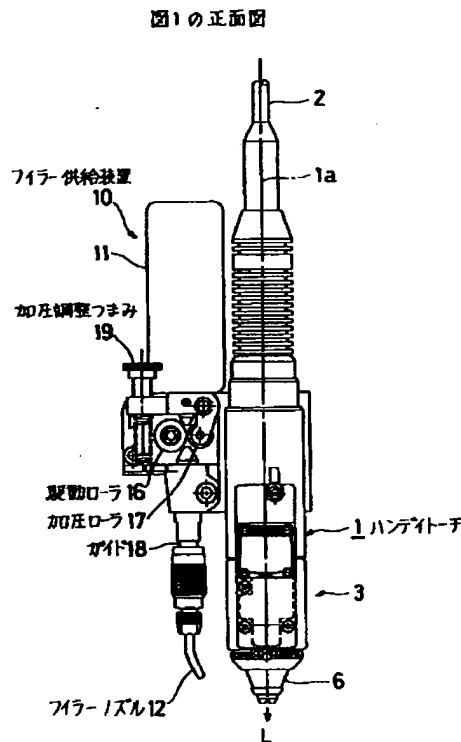
- 1 ハンドイトーチ
- 2 トーチリード
- 1a 軸中心線
- 3 トーチヘッド

- 4 コリメータレンズ
- 5 集光レンズ
- 6 ノズル
- 7 保護ガラス
- 8 CCDカメラ
- 9 アシストガス継手
- 10 ファイラー供給装置
- 11 ファイラーワイヤリール
- 12 ファイラーノズル
- 13 取手ハンドル
- 14 モータ
- 15 出射ボタンスイッチ
- 16 駆動ローラ
- 18 ガイド
- 19 加圧調整つまみ
- L レーザビーム

【図1】

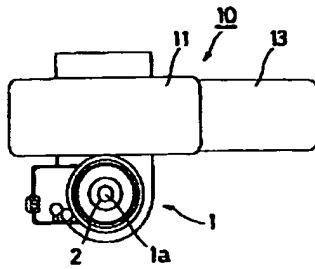


【図2】



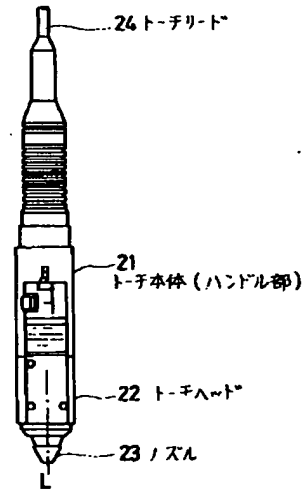
【図3】

図1の上面図



【図4】

従来のハンディトーチの一例の外観図



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the handicap torch as hand-held YAG laser processing equipment.

[0002]

[Description of the Prior Art] For example, this kind used for soldering or cutting of a plate work piece etc. of conventional hand-held YAG laser handicap torch had the general configuration as shows the external view of that example to drawing 4.

[0003] 21 is the body section for laser beam machining of a torch, and becomes the stock handle section. The torch head section which has the nozzle section 23 for work-piece processing to which 22 emits a laser beam L, and 24 show the torch lead for leading a laser beam to the body section 21 of a torch with an internal optical fiber from the non-illustrated source of a laser beam, and have the optical system for processing it by being spread in a parallel ray by the collimator lens to which un-illustrating mentions the laser beam from said optical fiber later, condensing with a condenser lens again, and making a laser beam L emit from the nozzle section 23.

[0004]

[Problem(s) to be Solved by the Invention] However, this kind of YAG laser handicap torch was not able to respond to the joint configuration which is mainly used for temporary attachment of a plate work piece, or soldering of plate work-piece base materials, for example, has a continuous clearance between base materials conventionally.

[0005] That is, to that of which the airtightness as a product is required, it was unreliable and was not able to be used for this kind of application.

[0006] Although fillers, such as a suitable metallic material wire, were used for the above clearance restoration soldering of base materials, for example, if it was in this kind of handicap torch, since precision actuation of coincidence supply of the separate filler wire by the same operator was impossible as a matter of fact and it was not able to be used for this kind of application, the application was limited on actuation of a stock format.

[0007] This invention was made in view of the above aspects of affairs, and aims at expanding the width of face of said processing application by carrying a small filler feeder in a handicap torch in one.

[0008]

[Means for Solving the Problem] For this reason, in this invention, it is going to attain said purpose by offering the YAG laser handicap torch characterized by fixing in one the filler feeder which consists of the filler nozzle which carried out contiguity arrangement for the Toride handle which built the filler wire feeding drive motor in the body of an YAG laser torch, a filler wire reel, a filler wire drive, and the processing nozzle of said body of a torch.

[0009]

[Function] By the above this invention configurations, since the small filler feeder was carried in the body of an YAG laser handicap torch, the same operator can perform airtight welding processing of the

work-piece material which has a clearance mutually, without spoiling the handiness etc., and the processing application can be extended.

[0010]

[Embodiment of the Invention] Below, the gestalt of operation of this invention is explained at a detail based on one example.

[0011]

[Example] The front view and plan of drawing 1 are shown in the side elevation of one example of the YAG laser handicap torch applied to this invention at drawing 1, drawing 2, and 3, respectively.

[0012] (Configuration) 1 is this body of a handicap torch, and has shaft-axis 1a. 2 has an optical cable inside with a torch lead, leads a laser beam L to the collimator lens 4 of the torch head 3 interior from non-illustrated YAG laser light equipment, is diffused in a parallel ray, results in a condenser lens 5, converges again, is emitted from the processing nozzle section 6 as a laser beam L for processing, and is used for processing. In addition, in 7, cover glass and 8 show the CCD camera for a processing section display, and 9 shows an assist-gas joint.

[0013] The description of this example is to have carried out attachment loading of the feeder 10 of the auxiliary packing material (filler) concerning this invention in [the body 1 of a handicap torch] one. Equipment 10 had the wire reels 11, such as stainless steel as a filler (for example, aluminum), and is equipped with the driving gear for supplying this filler wire to the processing nozzle 6 of a torch from the filler nozzle 12 which carried out contiguity arrangement. 13 is the Toride handle of the body 1 of a torch, built the motor 14 for a filler wire feeding drive in the interior, and equips the root headquarters of the Toride handle 13 with the button switch 15 for outgoing radiation. Furthermore, it has the pressurization adjustment tongue 19 including the driving roller 16, the pressurization roller 17, and the guide 18 grade as a drive.

[0014] (Actuation) Although the YAG laser beam L which an operator grasps the Toride handle 13, holds a torch 1 in the above configurations, and is emitted from a nozzle 6 performs predetermined work-piece processing When it has a clearance between each material work piece like previous statement, according to this invention configuration Since a required filler wire can be supplied to the processing nozzle 6 by the filler feeder 10 fixed to the body 1 more easily than the filler nozzle 12 by which contiguity arrangement was carried out, with the body 1 of a torch held, This kind can be worked without spoiling the handiness of handicap torch 1 body.

[0015]

[Effect of the Invention] As mentioned above, the width of face for material work-piece processing can be expanded, without sacrificing the handiness of handicap torch original on the body of an YAG laser handicap torch according to this invention, since attachment loading of the small filler feeder was carried out in one as explained.

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